CONTAMINANT EXPOSURE AND EFFECTS
TERRESTRIAL VERTEBRATES DATABASE FOR THE UNITED STATES

Barnett A. Rattner, Nancy H. Golden, Roger L. Hothem, Rebecca L. Kershnar, Thomas W. Custer and Craig W. Meeusen
USGS-Patuxent Wildlife Research Center, USGS-Western Ecological Research Center and USGS-Upper Midwest Environmental Sciences Center

ABSTRACT

Over the past 5 years a "Contaminant Exposure and Effects--Terrestrial Vertebrates" database (CEE-TV) focused on coastal and estuarine habitat in the United States has been compiled through computerized search of published literature, review of existing databases, and solicitation of unpublished reports from conservation agencies, private groups, and universities. The database, a product of the Biomonitoring of Environmental Status and Trends program, is designed to help evaluate the threat of contaminants and other anthropogenic activities to terrestrial vertebrates residing in or near Atlantic, Pacific and Gulf coast estuaries, and the Great Lakes. Summary information has been entered into the database, including species, collection date, site coordinates, estuary name, hydrologic unit catalogue code, sample matrix, contaminant concentrations, biomarker and bioindicator responses, and reference source, utilizing a 108-field character and numeric format. The CEE-TV database is web accessible (www.pwrc.usgs.gov/ceetv) in an easy to use searchable format, and receives about 3000 visits each year. Currently, the CEE-TV database contains 9836 records with ecotoxicological exposure and effects information on 400 species of amphibians, reptiles, birds, and mammals. Besides providing useful and interesting ecotoxicological information, the database has a number of potential applications, including focusing biomonitoring efforts to generate critically needed ecotoxicological data in the numerous "gaps" along the coast, reducing uncertainty about contaminant risk, identifying areas for mitigation, restoration or special management, and ranking the ecological conditions of estuaries.

INTRODUCTION

The Biomonitoring of Environmental Status and Trends (BEST) program is designed to assess and monitor the effects of environmental contaminants on biological resources, particularly those under the stewardship of the Department of the Interior. BEST examines contaminant issues at the national, regional, and local scales, and uses field monitoring techniques and information assessment tools tailored to each scale. As part of this program, the threat of contaminants and other anthropogenic stressors to terrestrial vertebrates residing in or near to Atlantic coast estuarine ecosystems is being evaluated by a retrospective analysis of environmental contaminant exposure and effects data in amphibians, reptiles, birds and mammals.

OBJECTIVES

1. Summarize information on contaminant exposure and effects in terrestrial vertebrates residing in or near Atlantic coast estuarine ecosystems.

2. Conduct a preliminary risk assessment of contaminant threats to terrestrial vertebrates at selected Atlantic coast estuaries to rank ecosystem health and identify critical data gaps.

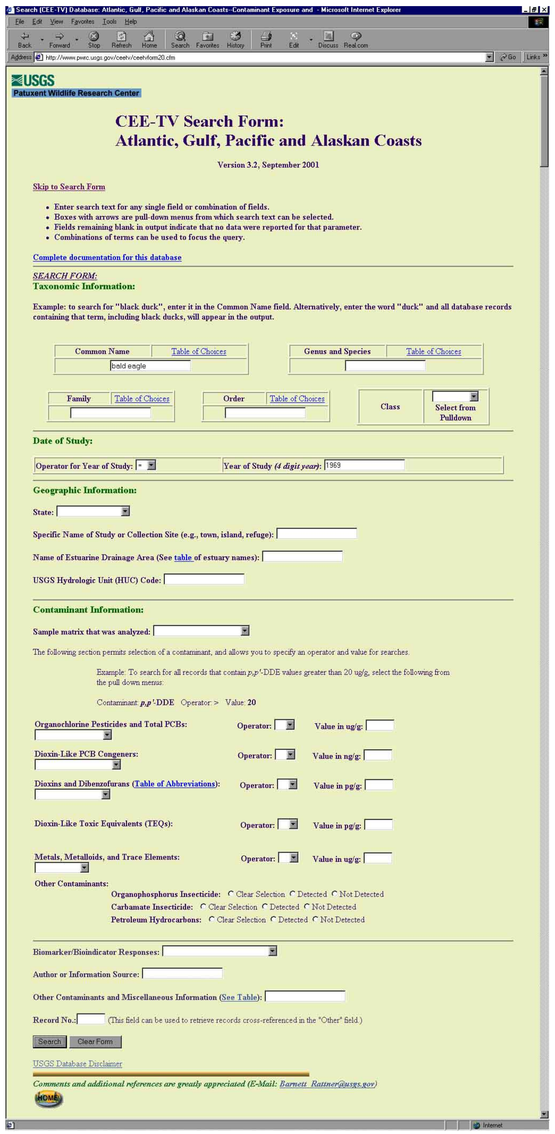
3. Provide an interactive "user-friendly" web-based tool to aid managers and researchers in contaminant-related wildlife studies and management activities.

METHODS

Data Compilation

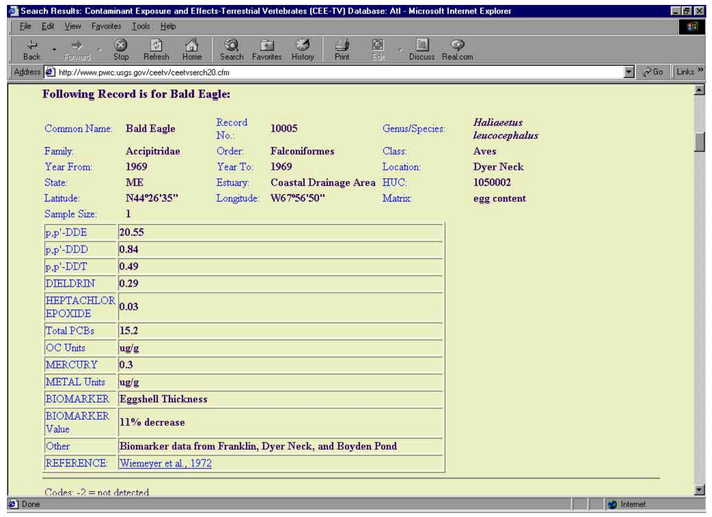
- Data were obtained through computerized literature searches, solicitation of unpublished agency reports, and search of existing institutional databases.
- Information including site and year of study, species studied, biological matrix analyzed, contaminant concentrations, biomarker response, and data source were entered into a 108-field database.
- Database and documentation were made accessible on the world wide web for interactive queries.

Search Form



RESULTS

Search Output



Summary Information

Total number of records: 9836

Individuals per record: 1 to 37,590

Total number of individual animals: ~250,000

Total number of species represented: 400

17.3%	Mammals
78.0%	Birds
4.3%	Reptiles
<0.5%	Amphibians

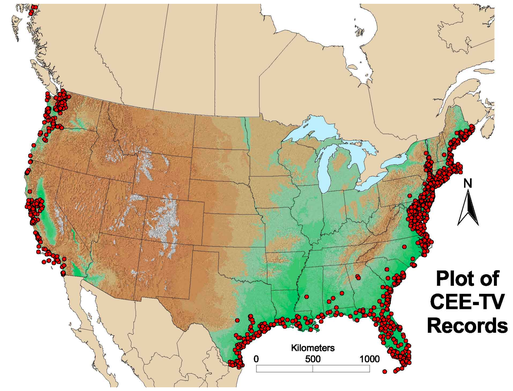
Sample matrices studied: 47

Unique contaminants: only 200

Contaminant Information

Contaminant	Contained In:
DDE, DDD and DDT	45% of records
Ah-receptor active PCB Congeners + Dioxins + Dibenzofurans	2% of records
Hg	21% of records
Pb	19% of records
Biomarker/bioindicator responses	11% of records

Geographic Distribution of Records



Total Number of Records per State

Atlantic Coast		Gulf Coast	
Maine:	249	Texas:	1035
New Hampshire:	30	Alabama:	43
Massachusetts:	176	Mississippi:	55
Rhode Island:	40	Louisiana:	242
Connecticut:	99		
New York:	900	Pacific Coast	
New Jersey:	411	California:	1840
Pennsylvania:	54	Oregon:	289
Delaware:	182	Washington:	703
Maryland:	471	Alaska:	657
Virginia:	385		
North Carolina:	209		
South Carolina:	406		
Georgia:	251		
Florida:	1178		

PRODUCTS and FUTURE ACTIVITIES

- Information in the CEETV database has been summarized and evaluated to contaminant threats to terrestrial vertebrates, to rank ecosystem health in Atlantic Coast estuaries, to identify data gaps, and to focus biomonitoring efforts to generate critically needed information on contamination and other anthropogenic threats to estuarine wildlife.
- A detailed analysis of critical data gaps was performed for National Parks and National Wildlife Refuges on the Atlantic Coast.
- Expansion of the CEETV database will include Hawaii (estimated completion in 2002) and the Great Lakes (estimated completion in 2003).